DOCUMENT RESUME

ED 399 265 TM 025 094

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TITLE The Effects of Coaching on the ACT Scores of African-American Students.
PUB DATE Apr 95
NOTE 19p.; Paper presented at the Annual Meeting of the American Educational Research Association (San Francisco, CA, April 1995).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Achievement Gains; *Black Students; College Bound Students; *College Entrance Examinations; *Scores; *Test Coaching; Test Results; Test Wiseness; *Tutoring
IDENTIFIERS *ACT Assessment; *African Americans

ABSTRACT

Interest in the effectiveness of test coaching has prompted many studies, almost all of which have been directed toward coaching's effect on results of the Scholastic Assessment Test (SAT). The focus of this research was to investigate whether preparation for the American College Test (ACT) provided by professional coaches would raise the scores of African-American students. Subjects were 19 African-American high school students working as summer law interns (a special summer program conducted by St. Louis, Missouri Public Schools) who participated in pretest and posttest. Instruction was provided by professional coaches from the "Focus on Learning" tutoring company in a 6-week program on Saturdays. The average increase among these students was 1.34 points. Consideration of other variables made it apparent that the majority of the increase could be attributed to the coaching they received. Although the increase was modest, it might have made a difference in obtaining admission for the students who derived the most benefit. The study shows that, with proper intervention, the ACT scores of African-American students can be increased. (Contains 1 table and 18 references.) (SLD)

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The Effects of Coaching on the ACT Scores of African-American Students

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Paper presented at the Annual Meeting
of the American Educational Research Association

San Francisco
April, 1995

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Introduction

Gaining entrance into the college of one's choice is among the most exciting and important events in a young person's life. Consequently, when one considers the major impact college entrance exams have in the admissions process (Becker, 1990; Educational Research Service, 1981; Powers, Alderman, & Noeth, 1983; Wilder, 1989) performing well on these exams becomes a high stakes process (Powers, Alderman & Noeth, 1983; Wilder, 1989). Because of the importance of these tests, many students and parents are prepared to pay large sums of money for test preparation classes (Becker, 1990, Smyth, 1989, Wilder, 1989). Preparation courses for the SAT are booming, with as many as 100,000 to 150,000 students out of 1.8 million SAT takers participating (Putka, 1992). In addition, many schools are including test preparation in their curriculum. It is estimated that as many as one-third of the schools in the Northeast offer some type of preparation course. This interest in specialized test preparation, sometimes referred to as "coaching", raises questions both about its effectiveness in raising scores and its ethics, since the cost may exclude many students (Putka, 1992) and methods (Becker, 1990; Educational Research Service, 1981; Popham, 1991).

Over the past 30 years interest in the effectiveness of coaching has produced dozens of studies, almost all directed toward what is now called the Scholastic Assessment Test (SAT) (Becker, 1990; Hulsart, 1983,

Powers, 1982). There appear to be two major reasons why the research has focused on the SAT: 1) The SAT is used by schools where the competition is the greatest; and 2) the SAT has over time evolved into a barometer used to measure the academic effectiveness of high schools (Hulsart, 1983; Smyth, 1989).

Although the American College Test (ACT) is also taken by a large number of students, it has been less widely publicized (Hulsart, 1983) and researched. Doctoral research completed by this author in 1993 investigated the effects of coaching on the ACT scores of students at a large Midwestern university. A complete search of the ERIC, PSYCHLIT, SSCI and Dissertations Abstracts International produced only 2 other published research documents examining the effectiveness of coaching for the ACT.

Purpose of this Research

Many colleges and universities have initiated programs to increase the enrollment of African-American students. Most of these programs provide some preparation for the standardized admissions test these students need to take. For high school students in the city of St. Louis, the majority of whom ar African-American, the test of choice is the ACT.

Since little published research exists about the effectiveness of

coaching on increasing ACT scores , the purpose of this research was to investigate whether ACT preparation provided by professional coaches could increase the scores of African-American students. If coaching can significantly raise the scores of African-American students, their access to institutions of higher education, especially the more selective universities, can be improved. And although the net result is the same, the implicit benefit of improving college entrance tests scores is that college access is increased by improved test scores rather than lowered standards, the practice now utilized by some institutions who are eager to increase their enrollment of African-American students.

Perspective or Theoretical Framework

A student's score on a standardized test can be considered to have 3 components: a true score component, a test specific component, and random error (Becker, 1990). Both the true score and test specific score of an individual's score are targets of coaching interventions.

Most coaching interventions can be classified into four categories (McCormack, 1987). The first type of coaching seeks to improve general testwiseness. The second attempts to increase test familiarization, targeting the test-specific score. This style of coaching has a relatively short duration and is designed to acquaint students with the formats of the questions on a specific standardized test. The third style can best be

described as "concentrated drill and practice" on sample items likely to be similar to those found on actual tests. This style of coaching also targets the test-specific component. The fourth type of coaching involves instruction in the content domain. This style would include coaching which provides a systematic review of the content of high school courses related to a specific standardized test. This type of intervention takes by far the most time and is concerned with increasing the domain knowledge of the student. This coaching strategy is designed to increase the overall knowledge and hence seeks to increase an individual's "true score."

Some research demonstrates that each of these four coaching interventions may be effective in increasing scores on standardized tests. The following sections summarize some of the research for each intervention practice. Since there is so little research about ACT preparation, most of the researched summarized will deal with the SAT.

The Effects of Coaching to Improve General Testwiseness

Some students prepare for the SAT by receiving instruction in general problem solving strategies. The meta-analysis by Kulik, Bangert-Drowns, and Kulik (1984) revealed mixed results. Their analysis showed that 2 studies which included this type of coaching had an average effect size (treatment vs control) of .13 (standard deviations). This is compared to 11 studies which were only drill on past tests (effect size = .18 standard deviations) and one study which just provided a short orientation (effect

size = .05).

Kulik, Bangert-Drowns, and Kulik (1984) also compared studies which included a testwise component (n=5 studies) to those which did not (n=9 studies). Their analysis revealed an average effect size with this component was .20, while the effect size for those without was .08. This would indicate that instruction in testwiseness is effective in increasing SAT scores.

Relative to other types of coaching interventions, there has not been much research regarding the effects of increased testwiseness on scores on the SAT. In general, Walstrom & Boersman (in Anastasi, 1981) found that short orientation sessions can be effective in equalizing the differences between student's testwiseness.

Anastasi (1981) believes that the relatively small gain attributable to testwiseness is due to the amount of standardized test sophistication most students develop before they take the SAT and that all that is required for a modest improvement is a short orientation to the specifics of a particular standardized test.

Summary of the Research to Increase Test Familiarity

A study by Powers and Alderman (1979, in Powers, 1982) revealed that students who read "About the SAT," a short booklet designed to orient students to the SAT, felt that it helped them improve their scores. A comparison of the actual SAT scores, however, revealed little gain that

could be attributed to this preparation. Most research concerning the SAT groups this intervention with specific item practice. Very little research has been conducted relative to the effects of providing students with specific strategies for specific scores on specific tests.

Summary of the Research on the Effects of Specific Item Practice

Much of the coaching that is received by students trying to improve on the SAT involves practicing on items similar to those which they will encounter on the actual test. Since the Educational Testing Service (ETS) publishes past forms of he SAT, most of this practice is with former SAT questions.

In her meta-analysis, Becker (1990) examined the effects of practice with specific test items as well as practice using complete forms of past tests. Her results revealed that practice with specific items was the single most important variable associated with improving scores on the SAT. Interestingly, she found no relationship between taking complete past tests and improvement in SAT scores--suggesting that coaches who can identify specific types of items and provide practice with these items are effective in improving SAT scores.

As part of their meta-analysis, Kulik, Bangert-Drowns, and Kulik (1984) compared the effect size of studies which included practice (n= 13

studies) with those which did not (n=1). Their results revealed an average effect size of .16 (standard deviations) for the studies with practice and an effect size of only .03 for the study without. One problem with this result, however, is that there is no explanation about the type of practice that was provided by these studies. Another problem, of course, is that there was only one study that lacked a practice component.

In their study of urban gifted students Reynolds, Oberman, and Perlman (1988) also found practice with specific items to be effective in improving SAT scores. In their conclusion they write:

> Statistically and practically significant gain scores can be obtained on the SAT and PSAT, especially with the use of old tests for practice, drill, and feedback. The use of past PSAT forms serves the relevant function of familiarizing students with actual PSAT items rather than approximate items, thus giving students a greater sense of the type of items they can expect on the test. (p. 162).

Research on the effects of Long-Term Instruction in the Content Domain

Some studies have investigated the effects of long-term instruction in the content covered by a standardized test. Gains achieved through such intervention are sometimes referred to as "alpha" gains (Bond, 1989). The results of the meta-analysis by Becker (1990) revealed no relationship between this type of coaching and improved SAT scores. However, since the ACT is more of an achievement test than the SAT, this may be one area in which there is a large difference in the effectiveness attributable to a

particular intervention on the ACT.

Powers (1988) found a systematic review of the content domain was effective if the students were coached, but ineffective for those who were not.

Summary of the Research on the Effects of Coaching on ACT Scores

This section summarizes three research documents that investigate the effects of coaching on ACT scores. These are the only studies found after a complete search of the ERIC, PSYCHLIT, SSCI, and Dissertations Abstract International data-bases. Since the ACT underwent a major revision in 1989, only studies since 1989 were included in this search.

The first study by Lauderdale (1989) investigated the effects of using microcomputers and Krell software (a commercial software package designed to give students practice with simulated ACT items) as tools for preparing for the ACT. This study found no significant gains as a result of using Krell software and microcomputers (Lauderdale, 1989).

The second study by Seaton (1992) investigated the effects of coaching on ACT scores of 30 juniors from a large urban high school for girls. This study revealed that students who received a 10 hour preparation course increased their composite scores an average of 4 points (from 19 to

23, t=7.2, p<.001). For this study, the pretest was a retired ACT test, while the post test was an actual ACT. Consequently, there might have been a motivational difference which also contributed to this four point gain.

The third study is the doctoral research conducted by this author (Moss, 1993). This study investigated the effects of coaching on the ACT scores of students at a large Midwestern university. In this study, freshmen who had taken the ACT more than once were surveyed regarding their preparation for their second ACT. This study found no significant difference between the gain for students who said that they had received coaching, 1.09 points (n=52) and those who did not, .94 (n = 441). It is important to note, however, that this study did not investigate whether coaching can be effective, but whether or not the coaching these students received was effective. Taken together, these three studies indicate that how a student is coached may be more important than If they they are coached. Unfortunately, the study conducted by Seaton (1992) did not give any indication as to the types of coaching interventions employed.

Sample

The students in this study were all law interns, a special summer program conducted for juniors and seniors by St. Louis Public Schools. This program is part of a larger project, "The High School-Post Secondary Transition Initiative," funded through the Division of State and Federal

Programs. One goal of this program is to help more students from St. Louis Public Schools gain admission to college. To help achieve this goal, preparation for the ACT is provided to any student on a voluntary basis. Although there were over 100 interns in the program, only 37 chose to participate in the coaching class. Out of these 37, 21 took both the pretest and the post test. Two of these students were not African-American, thus leaving 19 African-American students in the sample.

Design

On Saturday, June 23, 1994, all students who participated in the coaching class were given ACT 9340D as a pretest. This pretest was published by ACT (1993) and is comparable to actual tests. The test was administered using the same procedures that are employed during actual ACT testing. On the next four Saturdays, each participating student received three and one-half hours of instruction. This instruction was provided by professional coaches from Focus on Learning, a private tutoring company in Columbia, Missouri, and utilized the four coaching interventions previously identified. Each of the coaches was a specialist in the content domain being instructed and was experienced with coaching the specific strategies relevant to the ACT.

Both the English and the mathematics sections utilized a three step process. The first step was a systematic review of the content relevant to

these two tests. The second step focused on general and specific strategies, with the majority of the time spent discussing specific strategies for these two sections. A key specific strategy that was stressed was how to pace oneself in order to achieve a predetermined goal score. The third step provided students practice with real ACT items and offered specific feedback regarding their performance.

Since the content on the reading and science reasoning tests are not as clearly defined as the content on the English and mathematics tests, preparation for these two tests involved only steps 2 and 3 (strategies and practice using past ACT questions).

In order to increase the potential effectiveness of this class, the students were divided into either the "high" or "low" group based on their pretest scores. Each group received 1 3/4 hours of English/reading instruction and 1 3/4 hours of math/science instruction each Saturday.

On the Saturday following the four weeks of instruction, each student was given another retired ACT (form 9139C) as the post test. In addition, each student was asked to complete a questionnaire regarding previous preparation, how many times they had taken a real ACT prior to the program, and how motivated each was to improve. These variables served as control variables within the analysis. Demographic information such as gender and the level of parent's education were also collected. These

allowed for the investigation of other factors potentially related to the effectiveness of preparation.

Although it would have been better to randomly select the students for this preparation and to have had a randomly selected control group, this was not possible for this study. The funding for this class required that all students who wanted to receive this preparation be included in the class. This was an unavoidable limitation in this study. Consequently, there may be some self-selection bias affecting the level of motivation to prepare for the test.

Results

The results of this study are summarized by table 1

Table 1
Pretest and posttest means

Section	Pretest		Posttest		Gain
	mean	SD	mean	SD	
English	15.05	3.89	16.79	4.20	1.79*
Math	16.58	4.72	17.37	4.28	0.79*
Reading	16.26	4.83	17.26	4.63	1.00*
Science	16.05	3.70	17.89	4.05	1.84*
Composite	15.98	3.73	17.33	1.34	1.34**

n = 19; * $p < .05$; ** $p < .01$

Since each of the tests are conceptually different, separate dependent t-tests were conducted to analyze the gain on each test as well as on the composite score. Regression analysis revealed no significant effects for any of the control variables or demographic variables. This, however, may be due to the relatively small sample size, hence making these low power tests.

Discussion

There are several factors to which the gain in ACT scores might be attributed. There was probably a slight practice effect, although since many of the students indicated that they had already taken at least one real ACT, this should have been minimal. Another possible factor may have been maturation. However, since this was only a 6 week program, this also should have been minimal or even negative since the preparation took place while the students were not in school. Third, since the students who dropped out scored, on average, lower than those who stayed, regression toward the mean would have actually pulled the gain down slightly. Moreover, the students had very little motivation to improve, most indicating

that they had not put any time into studying outside of the class.

Consequently, the great majority of the increase in ACT scores showed by these students can be attributed to the coaching they received. And although the average increase was only a modest 1.34 points, it could make a difference in obtaining admission for those who benefited most.

Educational or Scientific Importance

This study shows that, with proper interventions, the ACT scores of African-American students can be increased. Since other studies have found a positive effect for duration (Messick & Jungeblut, 1981) it is highly probable that more student-coach contact time (14 hours for 4 subjects is relatively short) would increase the effect of preparation. This would seem to be especially true if students are preparing for a "real" ACT during the school year. (Other unpublished research by this author has found that the timing of the coaching makes a difference to the outcome). Consequently, providing African-American students with appropriate intervention during the school year can increase their scores ad increase their access to institutions of higher learning.

Implication for Policy or Practice

The results of this study would suggest that all African-American students who plan to go to college should have access to appropriate

preparation for the ACT. Moreover, since students who are currently receiving professional preparation are disproportionately white, providing coaching to all African-American students may help bridge the gap between the ACT scores of these two races.

Need for Further Research

Further research investigating the effects of coaching on the ACT scores of African-American students needs to be conducted. This research should use a larger sample and, if possible, random selection, and a control group. A larger sample would allow for an examination of the specific effects of each type of intervention for specific sub populations (e.g. girls or low-ability students). Random selection would facilitate the generalizability of the study to all African-American students.

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